

# **EVALUATION OF SOCIAL FORESTRY PROJECT IN UTTAR PRADESH**

**(Sponsored and Financially Supported by the Planning Department,  
Government of U. P.)**

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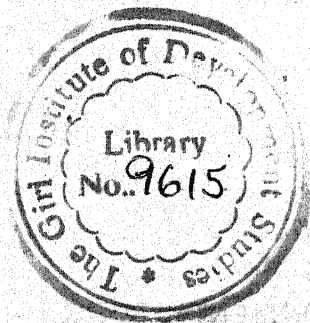
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## ACKNOWLEDGEMENTS

This evaluation of the Social Forestry Project was carried out at the request of the Planning Department, Government of Uttar Pradesh, who also provided the necessary financial support. I am grateful to them for their sponsorship and support. I wish to thank in particular Dr. J.P. Singh, Secretary Planning and Shri J.L. Bajaj, Secretary Finance, Government of Uttar Pradesh who took keen interest at all stages of the study and have been a source of great encouragement and support.

My thanks are also due to Shri V.B. Singh, Director, Social Forestry, Uttar Pradesh and Shri K.C. Govil, Forest Economist in the Directorate of Social Forestry, U.P., for extending their unreserved cooperation, making necessary secondary data available and arranging for field visits to the relevant districts. The Officers and staff at the district level also offered their fullest cooperation and went out of their way in accompanying me on field visits to various project sites. This made the task of data collection considerably easier. I am especially grateful to the following : Shri B.K. Patnaik, Divisional Director, Social Forestry, Sultanpur; Shri D.N.S. Sumen, Divisional Director, Social Forestry, Unnao; and Shri S.C. Jauhari, Divisional Director, Social Forestry, Mathura.

At the Giri Institute of Development Studies I received valuable help from Shri B.K. Srivastava, Research Assistant, in the tabulation of data. The task of typing the first draft of the report was handled by Shri Subhashis Mukherjee and the final stencilling by Shri V.K. Arjunan Achary. I am thankful to all these colleagues.

I would be failing in my duty if I do not record my gratitude to Dr. T.S. Papola, Director, Giri Institute of Development Studies, with whom I held a number of discussions which helped in clarifying my ideas to a great extent.

Needless to add that the responsibility for any shortcomings and errors is my own.

GIDS, LUCKNOW  
March 1984

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## EVALUATION OF SOCIAL FORESTRY PROJECT IN UTTAR PRADESH

### 1. Brief History and Organisation

The concept of Social Forestry was highlighted by the National Commission on Agriculture (1976). The scope of Social Forestry was defined to include farm forestry, extension forestry, reforestation in degraded forests and recreation forestry. The main objectives of social forestry, according to the Commission were :

- (i) "fuelwood supply to the rural areas and replacement of cowdung (as a fuel);
- (ii) small timber supply;
- (iii) fodder supply;
- (iv) protection of agricultural fields against winds;  
and
- (v) recreational needs". (Report of NCA, 1976, Vol.IX, Forestry 120).

The primary reason for suggesting a programme of social forestry in the country was the large gap between the requirement and availability of fuelwood. The Commission felt that the requirement of fuelwood in India by the year 2000 AD would be 225 million cu.m. while the supply from the by-products of production forestry in the form of lops and tops or residues of forest based industries would not exceed 60-70 million cu.m.



(Report of NCA, Vol.IX, p.67). Hence the need, in the opinion of the Commission, for a vigorous programme of social forestry.

In 1976-77 a centrally-sponsored scheme of social forestry was initiated in Uttar Pradesh. Till 1979-80 plantations of mixed species over 13,556 hectares and 19,739 row Km. of shelter belt plantations were reported to have been raised under this scheme (U.P., Draft Sixth Five Year Plan, Vol.1, p.477).

Since April 1, 1979 a World Bank aided Social Forestry Project has been in operation in 42 districts (list attached) of the State. All these districts are located in the plains region of the State where the forest area is very small (about 2 per cent of the land with an average per capita availability of forests of only 0.01 ha.). The project is designed to strengthen the existing social forestry programme of U.P. in the selected districts. The main objectives of the project are to :

- (i) "plant 48,600 ha. in public and village lands, including a minimum of 3,000 ha. of pilot community self-help plantings in village common lands, to demonstrate to the rural population at large the benefits of afforestation, and distribution of 8 million seedlings for planting on private lands equivalent to 4000 ha.;

- (ii) secure the cooperation of the local population for social forestry plantings by involving villages in planning and execution; and
- (iii) build an organisation required to support a long-term social forestry programme through on-the-job training of foresters in community development".  
(World Bank, 1979, p.9).

For the implementation of the social forestry project a separate Directorate of Social Forestry headed by a forest officer of the rank of Chief Conservator of Forests has been created within the Forest Department. At the field level the project is implemented through 5 Regional Directors of the rank of Conservator of Forests. Under each of the Regional Directors there are 5 to 6 Divisional Directors of the rank of Divisional Forest Officers. In certain cases the responsibility of the Divisional Directors extend over one district while in others they are given charge of two districts. Thus for the 42 districts in which the project is being implemented there are 29 Divisional Directors. The Organisation Chart for the Social Forestry Project is given in Fig.1.

At the Division level the organisation of the project is given in Fig.2. The Divisional Director is helped by an Assistant Director of the rank of Assistant Conservator of Forests. The field staff consists of Plantation Officers (Range Officers) at the Tehsil level, Assistant Plantation Officers (Forester) - one for about four Development Blocks, and Forest Extension Workers (Forest Guards) generally for each block. In addition there are Nursery Malis employed either on regular or casual basis.



Fig.1

Organisation Chart of Social Forestry Project,  
U.P. (State Level)

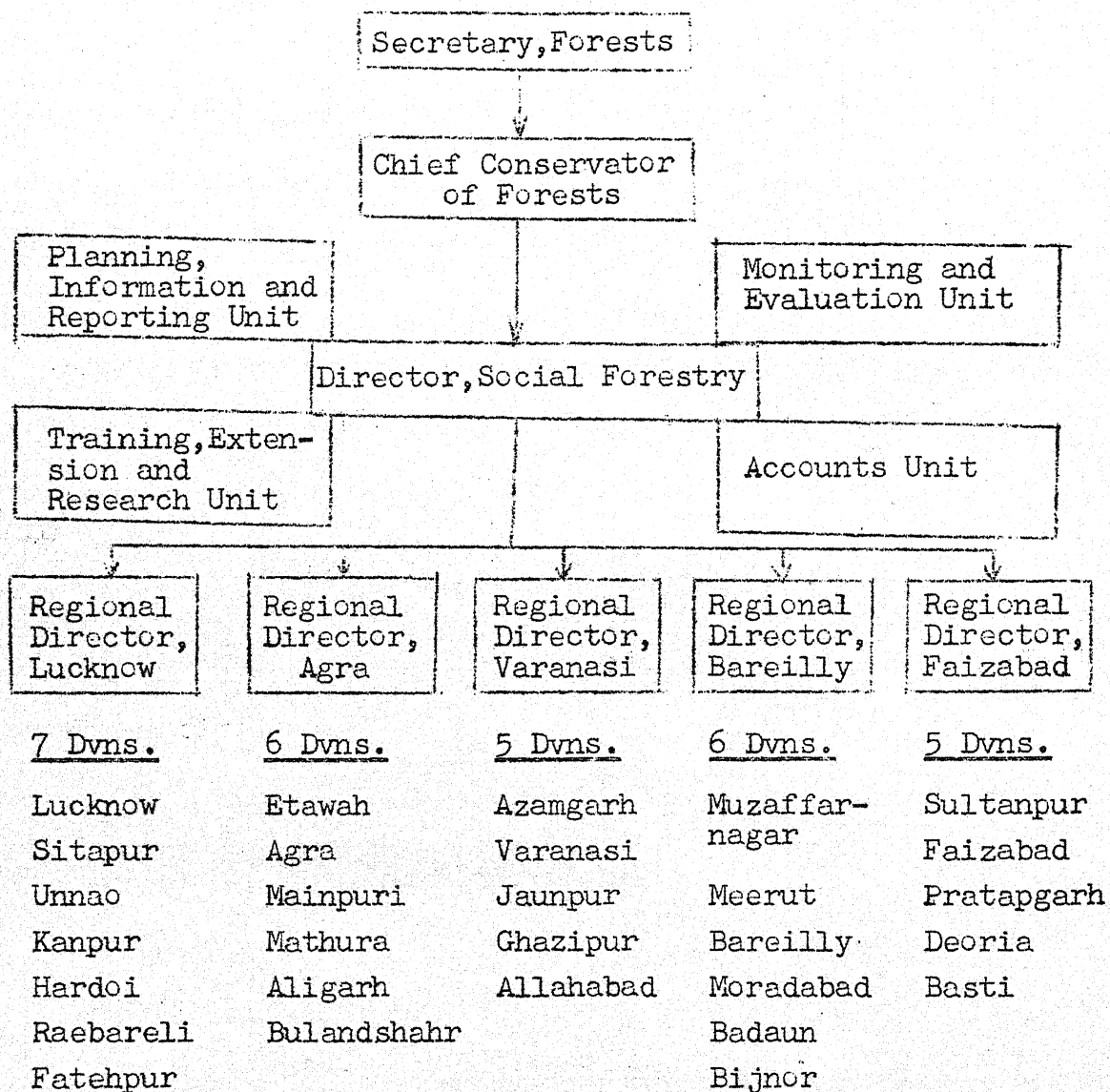
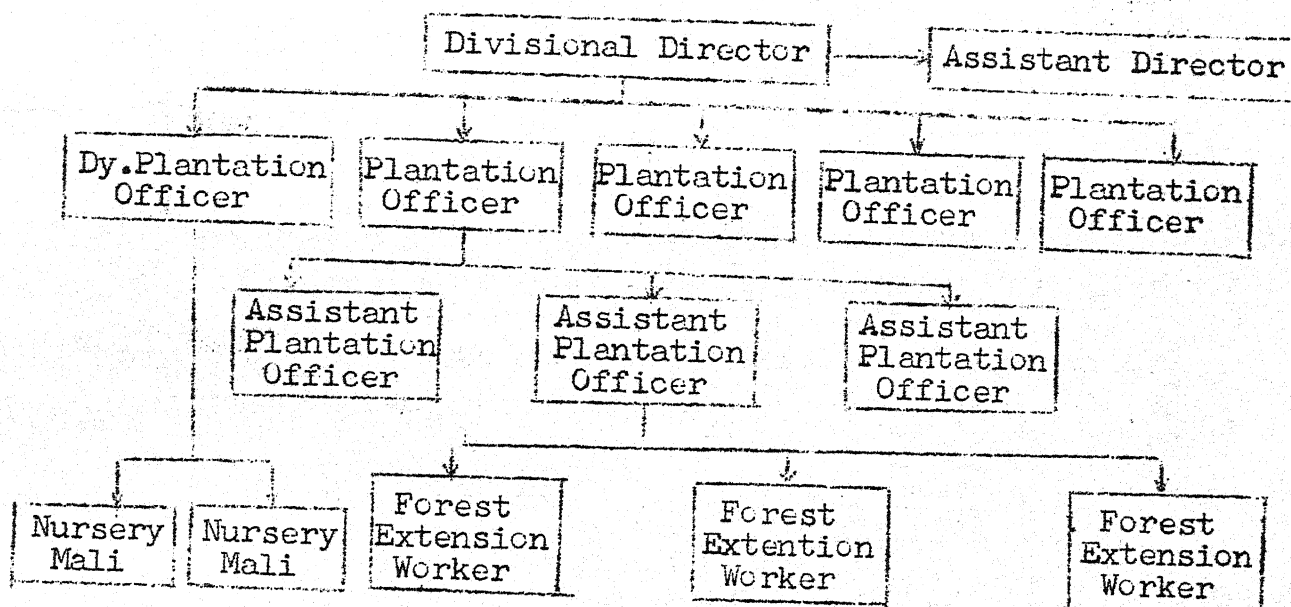


Fig.2

Organisation Chart of Social Forestry Project,  
U.P. (Division Level)



## 2. Present Evaluation

A. General : This report attempts an evaluation of the social forestry programme in three districts of Uttar Pradesh. The districts are Sultanpur, Unnao and Mathura lying in the Eastern, Central and Western regions of the State respectively. The evaluation is based on statistics collected from the respective Social Forestry divisions and intensive touring and field visits during November/December 1983 for observing the different kinds of plantations and activities taken up under the programme.

Before taking up a review of the work undertaken in the Social Forestry Programme in these districts it would be useful to have some idea of the potential (in terms of the area likely to be available) of afforestation in them. One indicator of this potential is the land use data. Table 3 below gives some idea of land use in the districts of Sultanpur, Unnao and Mathura. Further, some area for raising plantations is available on public lands like land along roads, railway lines and canals. The length of roads, railway lines and canals in these districts is given in Table 4.

It will be seen from Table 3 that recorded forest area is very small in all the three districts. As a percentage of total geographical area it comes to only 0.52 in Sultanpur, 3.53 in Unnao and 0.42 in Mathura. It needs to be remembered that much of the area recorded as forests may not, in fact, be under adequate tree cover. Consequently the actual forest area may be much less than what is suggested by the land use data.

Table-3Land Use Data : Sultanpur, Unnao and Mathura

	(Area in hectares)		
	Sultanpur	Unnao	Mathura
1. Geographical Area	4,40,670	4,61,736	3,77,093
2. Forest Area	2,288	16,277	1,581
3. Barren and Uncultivable	20,899	28,920	5,810
4. Culturable Waste	18,194	17,652	5,771
5. Permanent pasture and other grazing lands	1,679	3,182	1,973
6. Land under misc. tree-crops and groves (not included in net area sown)	10,609	12,055	1,582

Source : Uttar Pradesh Ke Krishi Ankare, 1982.

Table-4Length of Roads, Railway Lines and Canals:  
Sultanpur, Unnao, Mathura

	(In Km.)		
	Sultanpur	Unnao	Mathura
1. Length of roads:	783	915	565
a. Under P.W.D.	643	627	N.A.
b. Under Local Bodies	140	288	N.A.
2. Length of Railway lines	184	190	140
3. Length of Canals	983	1931*	2775*

\*Estimated on the basis of the relationship between length of Canals and Net Irrigated Area from Canals in Sultanpur

Source : District Statistical Hand Books of respective districts 1977.



In trying to estimate the area likely to be available for planting under social forestry we have made the following assumptions:

- a) Not more than half the area recorded under forests is likely to be under any kind of tree cover; hence 50 per cent of the forest area can be taken up for planting.
- b) A large part of the cultivable waste land may have been distributed to the rural people under various programmes. Hence only 25 per cent of this category may be available for planting (Tiwari, 1983).
- c) Not more than 10 per cent of the land classified as barren and uncultivable and permanent pastures and grazing lands may be suitable for planting (Tiwari, 1983).
- d) In estimating the area available for plantation along roads, railway lines and canals we have considered 1 Km. of plantation equal to 1 hectare as per the following calculations : trees to be planted at a spacing of 3m.x 2m. in three rows on both sides of roads, railway lines and canals and assuming a norm of 2000 plants per hectare as is the current practice of the Forest Department.

Based on these assumptions we find that the area likely to be available for planting may be estimated at 9900 hectares in Sultanpur, 18798 hectares in Unnao and 6492 hectares in Mathura. If this entire area is planted in the next few years then the total forest area (including half of the presently recorded forest area which we have assumed to be under some sort of tree cover) as a percentage of geographical area would

come to 2.51 in Sultanpur, 5.83 in Unnao and 1.93 in Mathura. This is still substantially less than what was recommended by the National Forest Policy (1952) viz., twenty per cent of the area in the plains regions should be under forests.

As against these estimates the actual area planted in these districts since the establishment of social forestry divisions is given in Table-5. It will be seen that the area planted in Sultanpur in 4 years (1979-80 to 1982-83) comes to 1981 hectares, in Unnao in 3 years (1980-81 to 1982-83) it is 1446 hectares and in Mathura it is 1063 hectares in 2 years. The area planted each year has been increasing in Sultanpur and Unnao while in Mathura there has been some decline in the latest year. One possible reason could be the unprecedented floods in Mathura in 1983 leading to widespread waterlogging which naturally affected the planting operations.

Keeping in mind the area likely to be available for plantation in the three districts as estimated above and the area planted so far we find that if 800 hectares are planted every year in each district (as was the achievement of Sultanpur in 1982-83), it will take about 10 years to complete the plantation work in Sultanpur, 22 years in Unnao and 7 years in Mathura.

This, however, should not imply that the work of social forestry can come to an end after the entire area identified has been planted. On the contrary, as suggested above, even with the plantation of this area, the coverage of forests would only be rather modest and far below the norm recommended

by the National Forest Policy. Hence efforts would have to be made to get more land for afforestation and to motivate a large number of cultivators to take to agro- and farm-forestry on a big scale. The latter, it should be noted, is also one of the important objectives of the social forestry programme in Uttar Pradesh.

Table-5

Year-wise Details of Area Planted by Type of Plantation in Selected Districts

(Area in hectares)

District/ Year	Type of Plantation						Total
	Road- side	Railway Lines	Canal	Forest Block	Gram Samaj	Other	
<u>Sultanpur</u>							
1979-80	18.31	22.90	7.40	90.00	-	-	138.61
1980-81	60.00	117.61	4.45	100.00	75.91	-	357.97
1981-82	97.75	197.75	7.00	172.00	179.79	28.00	682.29
1982-83	117.14	127.77	160.77	163.00	221.10	12.50	802.28
TOTAL	293.20	466.03	179.62	525.00	476.80	40.50	1981.15
<u>Unnao</u>							
1980-81	119.00	30.00	53.00	171.00	6.00	-	379.00
1981-82	101.00	37.00	23.00	312.50	25.00	12.00	510.50
1982-83	86.00	60.00	20.00	352.00	23.50	15.00	556.50
TOTAL	306.00	127.00	96.00	835.50	54.50	27.00	1446.00
<u>Mathura</u>							
1982-83	221.00	-	72.68	206.00	105.20	-	604.88
1983-84	108.50	12.00	39.80	145.00	153.00	-	458.30
TOTAL	329.50	12.00	112.48	351.00	258.20	-	1063.18



B. Nurseries : The successful implementation of the social forestry programme depends to a large extent on the timely availability of plants in sufficient numbers at a reasonable distance from the planting areas. Hence the need to establish a network of nurseries in each division to supply plants for departmental plantations as well as to individual cultivators for planting on private lands. This aspect of the programme has also been underlined in the World Bank Appraisal Report which recommended that funds be provided for establishment of 90 new nurseries and rehabilitation of 50 existing ones so as to provide one nursery for each of the proposed Forest Ranges.

We found the actual progress in the establishment of nurseries much higher than the recommendations of the World Bank. At the end of 1983 there were 44 nurseries in Sultanpur, 18 in Unnao and 20 in Mathura Division, with a total area of 64.98, 29.99 and 31.90 hectares respectively. Most of the nurseries (over half) are in the 1-2 hectare range while a few are smaller than 1 hectare in size or larger than 2 hectares.

The total number of plants raised in these nurseries in 1983 was 80,92,717 in Sultanpur, 51,67,442 in Unnao and 66,91,204 in Mathura (These numbers, however, include the unused plants left over from the previous year). The number of plants utilised by the Department in its plantation programme (including those supplied to other Government departments) was 15,95,160 in Sultanpur, 12,80,333 in Unnao and 9,19,424 in Mathura. Further, the number of plants supplied

to individuals for planting on private lands was 10,60,000 in Sultanpur, 8,14,837 in Unnao and 10,95,053 in Mathura. In this way only 33 per cent of the plants raised were utilised in Sultanpur while in Unnao and Mathura the utilisation rate was 40 per cent and 30 per cent respectively. The remaining were left over in the nursery. These plants are utilised in a number of ways. Some are used in beating up operations, while a large number are carried over to the next year to be used as 'Pindi' plants. Some may even be left to grow into trees in the nursery itself. In certain cases it was found that where the area of the nursery is rather large (i.e. more than 3 or 4 hectares) some plants, especially encalyptus, are being utilised to raise dense plantations.

It would appear from the above data that the number of plants raised is much more than the number utilised. This would tend to question the need for having so many nurseries in a division. However, a network of nurseries spread more or less evenly through out the division appears to be necessary for one important reason. Under the Social Forestry Programme the Forest Department has the responsibility of encouraging tree plantation on private lands, especially along field bunds, as wind-breaks and shelter belts, as block plantations and in the vicinity of houses so that the rural people may be able to meet their own needs of fuel-wood, fodder and small timber and protection may be offered to agricultural lands from adverse environmental conditions. For this it is important that the rural people should be able to get plants from nurseries without having to go long distances and incur a heavy cost in transportation.

This fact also creates a problem for the department, especially in trying to estimate the demand for plants from individuals. While it can have a reasonably clear idea of how many plants would be needed for its own plantation work, estimating the requirements of the people often poses a problem. The general practice is that targets for raising plants are given to the Forest Department after meetings at the District level convened by the District Magistrate. These targets are based on estimates of number of plants likely to be planted in each block given by the Block Development Officers. The Forest Department then raises the plants according to these targets. While the Block Officials are expected to motivate people for planting trees on their lands they do not have any responsibility of actually supplying the plants. This appears to be the major reason for the wide disparity in the number of plants raised and those actually utilised.

Curiously, we found a wide difference between the figures of the Forest Department and of the District administration (relying mainly on reports of the Block Development Officers) as to the number of trees planted by individuals. The latter invariably show the original targets as having been realised or even exceeded while the former are much lower - in many cases four to five times lower. The discrepancy between the two figures is sought to be explained by pointing out that many people do not buy plants from Forest Department nurseries, but from private nurseries, Horticulture Department nurseries and sometimes even from adjoining districts. While

this may be happening to some extent, it cannot really explain the very wide divergence between the two sets of figures. The capacity for raising plants established by the Forest Department cannot be matched by any other agency - private or government. In fact our observations did not reveal any private nursery in any of the districts visited. The Horticulture Department does have nurseries for raising fruit trees but their number and capacity is much smaller than that of the Forest Department. Further plants are supplied from Forest Department nurseries at the rate of 20 paise per poly pot plant which is somewhat lower than the actual cost of raising plants (see below). It is doubtful if any private nursery can compete with departmental nurseries either in terms of number of plants or in terms of cost.

The Forest Department figures of number of plants sold appear to be more reliable for another reason as well. These figures are based on records of nurseries and money realised from sale of plants has to be deposited in the Government account for which proper receipts exist. There is no such check on the other set of figures.

What this suggests is that in future the Forest Department may have to scale down its targets for raising nursery plants so that it does not carry huge stocks of unused plants. Its own requirements can be estimated fairly accurately. The requirements of the people may be estimated by increasing the figures for the previous years sale by a reasonable amount



based on past trends. By way of illustration it may be pointed out that the number of plants sold in Sultanpur in different years was as follows : 1981-82 - 1,22,000; 1982-83 - 9,29,000; and 1983-84 - 10,60,000. Similarly in Unnao 5,43,943 plants were sold in 1982-83 and 8,14,837 in 1983-84. These figures show a 661 per cent increase between 1981-82 and 1982-83 and 14 per cent increase between 1982-83 and 1983-84 in Sultanpur. In Unnao there was a 50 per cent increase between 1982-83 and 1983-84. While no clear trends seem to emerge from these data mainly because the time period is short and in the first year or two of the programme there is bound to be a big spurt in the sale of plants, yet it may be assumed that after the first year or two the demand for plants is not likely to increase by more than 25 per cent of the previous years sales.

There would thus appear to be a strong case for reducing the number of plants raised in nurseries. Instead of reducing the number of nurseries it may be better to retain a network of nurseries spread through out the division but smaller in size - say upto 2 hectares depending upon the demand for plants both for departmental use and by individual cultivators in different areas. On an average about 1 lakh plants are raised on an one-hectare nursery while the average annual expenditure comes to about Rs.40,000 to Rs.50,000 per hectare of nursery. Since there is a proposal to establish one nursery per block on lands of marginal farmers, it may not be advisable to increase the number of nurseries in a Division. If the size of the nurseries is reduced as suggested above then

the area which is likely to become surplus in the larger ones can be utilised for block plantation by means of plants already available in the nurseries.

### C. Cost of Raising Plants

As mentioned earlier, one of the important objectives of the Social Forestry Programme in Uttar Pradesh is to encourage and motivate the people, especially in the rural areas, to take up tree planting in the form of farm forestry. For this purpose the Forest Department undertakes to provide plants to them from its nurseries. The price of the plants has been kept rather low at 20 paise per polypot plant and 40 paise per pindi plant. The prices were raised in 1983. Till then only 10 paise were being charged for polypot plants. In order to find out whether any subsidy is involved in supply of plants at this rate, and if so to what extent, we have tried to calculate the cost of raising plants in nurseries. For this purpose we collected details of cost in a few nurseries of Unnao and Mathura. Two sets of estimates have been presented - first on the basis of only variable costs (i.e., excluding capital costs incurred in the establishment of nurseries) and the second by including both fixed and variable costs.

Data in respect of seven nurseries - four in Unnao and three in Mathura is presented below (Table-6). It will be seen from the table that the cost of raising plants taking into account only the annual expenditure incurred in the nurseries varies between 17 paise and 22 paise in the seven

nurseries. Costs are lowest when 4 lakh plants are grown in one hectare. Our data seem to suggest that if 2.2 lakh plants are grown in a nursery then the cost of raising plants is about the same as the sale price of plants, if we consider only the annual expenditure on nurseries. At a lower density than this the excess of costs over price comes to between 2 to 5 paise per plant.

Table-6

Cost of Raising Plants in Nurseries on the  
Basis of Variable Costs

Nursery	Area	No. of plants raised (lakhs)	Expenditure incurred (1983-84)Rs.	Cost/plant (Paise)	
UNNAO					
	Jinedpur	1.00	1.65	37,078	22.47
	Shadipur	1.00	2.20	42,380	19.26
	Takia	1.00	4.00	66,791	16.70
	Purwa	0.70	2.20	41,155	18.71
MATHURA					
	Sadabad	2.00	4.00	95,616	23.90
	Ronchi				
	Bangar	2.00	3.50	80,001	22.86
	Basauti	2.00	3.50	84,773	24.22

In case the capital cost incurred in the establishment of the nursery is also taken into account and depreciation and interest also included in computing the cost of raising plants, then we find that the cost goes up by about 0.6 paise per plant. In Table 7 below we have presented cost estimates from two nurseries in Unnao in respect of which item-wise details of expenditure were available.



Table-7

Cost of Raising Plants in Nurseries (Including Capital Expenses)

Items	Nurseries	
	Takia	Purwa
1. Capital expenses (Rs.)	15,450	8,145
a) Land preparation (Rs.)	3,650	2,445
b) Fencing (Rs.)	1,000	1,000
c) Mali Shed (Rs.)	800	700
d) Boring expenses (Rs.)	1,000	1,000
e) Pumpset and accessories (Rs.)	9,000	5,000*
2. Depreciation @15% on (e) (Rs.)	1,350	750
3. Interest @7% on 1 (Rs.)	1,082	570
4. Annual Running Expenses (Rs.)	66,791	41,155
5. Total Expenses 2+3+4 (Rs.)	69,223	42,475
6. No. of plants raised (lakhs)	4.00	2.20
7. Cost per plant (Paise)	17.31	19.31

\*This is only a notional cost as an old pumpset from an abandoned nursery was used.

It may be mentioned that our data show that generally the cost of raising plants is higher in Mathura than in Unnao. The main reason for this is that on an average more plants are raised per hectare of nursery in Unnao than in Mathura. Mathura division has also been facing a peculiar problem of raising eucalyptus plants (which constitute over 50 per cent of plants raised) in nurseries. The mortality rate is very

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high (40-50 per cent) at the stage of pricking. The plants that survive tend to do well subsequently. It has been found that the cause of this problem is soil salinity combined with high electrical conductivity in the water. The problem appears to be most acute in Mathura range. Thus the demand for eucalyptus plants (which is quite high as cultivators seem to demand only eucalyptus notwithstanding the big controversy surrounding it) is being met to a large extent from 3 nurseries of Okhla Range which are situated outside Mathura district in Haryana and Delhi. Mathura Division, it may be pointed out, has responsibility of plantation along the Yamuna Canal which takes off from the Okhla Barrage in Delhi and passes through Haryana before entering U.P. About 40 per cent of eucalyptus plants raised in Mathura Division are accounted for by the three nurseries of Okhla Range.

#### D. Plantations

As mentioned earlier plantations under the Social Forestry Programme have been taken up in the following categories of land : along roadsides, railway lines and canals, gram samaj lands, forest blocks and on other land which consists primarily of small plantations of Arjuna for tassar rearing on pilot basis for demonstration purposes. Generally speaking the land along roadsides, railway lines and canals is of good quality and a wide variety of trees including commercial species like Shisham and fruit and other species which are of great benefit to the local people e.g. mango,

kathal, mahua, neem, imli etc. can be raised. Forest blocks and Gram Samaj lands taken up for plantations tend to be degraded and undulating areas which are not fit for growing commercial or other useful species. In many cases they are also highly alkaline or saline (usar) which further reduces the choice of the species that can be grown. However, since most of the good land is already under the occupation of people - whether legally or illegally - the only kind of land that is likely to be available for planting as forest blocks and gram samaj plantations will be degraded land of poor quality.

Table 8 below gives the breakdown of the main species planted in the three districts of Sultanpur, Unnao and Mathura on different categories of land in 1982-83. It will be seen that generally there is a good mix of different kinds of plants in almost all kinds of plantations. Species of commercial value like eucalyptus and Shisham have been planted mainly along road-sides, railway lines and on canal banks. On forest blocks and gram samaj lands they have been only sparingly planted. Thus we find that in Sultanpur eucalyptus constitutes 31 per cent of roadside plantations, 21 per cent of plantations along railway lines and 54 per cent of canal bank plantations. The percentage of Shisham plants in these three categories of plantations is 16, 22 and 7 respectively. Thus these two species together account for 47 per cent of roadside plantations, 43 per cent of plantations along railway lines and 61 per cent of canal bank plantations. In Unnao

Table-8

Distribution of Main Species in Different Types  
of Plantations 1982-83

(No. in '000s)

Type of Plantation/ District	Eucaly- ptus	Su- Babool	Misc. fuel	Kanji	Shisham	Siris	Arjun	Other	Total
<u>Road Side</u>									
Sultanpur	44.85	5.41	27.75	7.55	23.10	5.52	20.42	2.47	143.19
Unnao	59.88	18.17	9.19	1.74	6.43	4.33	2.80	10.24	118.55
Mathura	6.10	4.50	62.40	10.95	37.95	6.10	2.50	208.03	339.72
<u>Railway line</u>									
Sultanpur	33.13	4.07	27.13	3.39	35.18	13.10	30.75	6.73	159.48
Unnao	9.10	7.50	8.97	0.85	1.25	0.50	3.15	9.20	42.56
Mathura	-	-	-	-	-	-	-	-	-
<u>Canal Bank</u>									
Sultanpur	156.28	24.54	44.21	1.84	19.12	17.33	5.14	14.42	290.51
Unnao	8.18	2.00	12.10	3.73	0.40	3.30	3.00	2.03	37.09
Mathura	7.30	15.60	6.98	2.75	11.88	-	1.30	1.50	58.53
<u>Forest Block</u>									
Sultanpur	3.22	3.24	23.66	5.28	18.30	17.30	8.29	20.00	102.89
Unnao	0.90	3.63	122.18	13.09	1.01	11.56	3.33	4.12	160.30
Mathura	-	-	41.25	5.19	-	-	2.00	104.00	152.44
<u>Gram Samaj</u>									
Sultanpur	17.40	10.43	28.06	9.95	55.07	28.41	30.01	15.80	214.81
Unnao	1.20	1.05	4.23	1.75	0.55	2.02	-	0.40	11.40
Mathura	-	1.00	47.40	9.95	0.70	2.00	12.00	113.20	186.25

Source : Social Forestry Directorate, "Samajik Vaniki  
Prayojana Ke Antargat Bhautik Uplabdhiyan,  
1982-83".



the percentage of eucalyptus in roadside plantations is 60, in plantations along railway lines 21 and in canal bank plantations 22. The corresponding figures for Shisham are 5 per cent, 3 per cent and 1 per cent respectively. In this way eucalyptus and Shisham together account for 65 per cent of roadside plantations, 24 per cent of plantations along railway lines and 25 per cent of canal bank plantations. The situation in Mathura is somewhat different as the percentage of eucalyptus plants is rather low in roadside and canal bank plantations - only 2 per cent in the former and 12 per cent in the latter. Shisham constitutes 11 per cent of roadside and 20 per cent of canal bank plantations. Thus these species together account for 13 per cent and 32 per cent respectively of the two kinds of plantations.

It is interesting to note that miscellaneous fuelwood species and other minor species constitute a significant proportion of roadside, railway line and canal bank plantations. Their proportion is much higher in Mathura than in the other two districts. Their share in these three kinds of plantations is as follows : Sultanpur 21, 21 and 20 per cent respectively; in Unnao, 16, 43 and 38 per cent respectively and in Mathura 80 per cent on roadside and 14 per cent on canal bank plantations. It is thus quite clear that these three types of plantations have kept in mind the fuelwood requirements of the people. Besides these species there are others too like Kanji which supplies fuelwood and oil-seeds

and Siris and Su-babool which provide fuelwood and fodder which have been planted in significant numbers in all three districts in the above three types of plantations.

Coming next to forest block and gram samaj plantations we find that in terms of the distribution of species planted they are clearly intended to meet the needs of the local people for fuelwood and fodder. The proportion of eucalyptus and shisham plants is much less while that of miscellaneous fuelwood species and other species is much higher. It is only in Sultanpur that one finds a significant percentage of shisham plants in forest block (18%) and gram samaj (26%) plantations. Further some eucalyptus plants have also been planted on gram samaj lands in Sultanpur and Unnao - this proportion being 8 per cent and 10 per cent respectively.

Our own observations in the field also tend to confirm the impression emerging from the aggregate data presented in Table 8. We found that, generally speaking, only poor quality land is available for raising forest block or gram samaj plantations. As a result the choice of species is also limited. In many cases lands available for these types of plantations are undulating, rocky and usar with high levels of alkilinity or salinity. Thus the species that have been mainly used for plantation are Babool, Prosopis Juliflora, Parkinsonia, Kanji, Arjun etc. Babool and Prosopis have been widely planted especially in Mathura and Unnao mainly because of the poor quality of land. Interestingly eucalyptus and shisham have

been planted in gram samaj plantations mainly by village people who have raised them under the self-help programme. Under this programme all the operations like digging pits, making mounds, providing protection trenches or fencing and taking up planting are done by the village people while plants are provided free of cost by the Forest Department. We came across a few self-help plantations, mainly in Sultanpur, where the predominant species were eucalyptus and shisham. In one particular case we saw a 12.5 acre self-help plantation on rocky undulating land devoted exclusively to eucalyptus and shisham even though the land did not appear to be suitable for these plants. This fact was reflected in the poor and stunted growth of the plants.

The rate of success of the plantations generally varies between 40 to 95 per cent. There are a number of factors which exercise an influence on the survival of plants. The first and foremost is of course biotic pressure, especially the pressure of grazing. The pressure of grazing is extremely high in the rural areas because people invariably leave their animals out to graze in open spaces and the practice of stall-feeding is not generally prevalent. Thus saving the plants from being browsed or trampled by grazing animals is a big task. While protection of plantations by means of barbed wire fencing can reduce grazing damage to a minimum, it has not been adopted under the social forestry programme for a number of very valid reasons. For one, it is



very expensive and if adopted would push up the cost of the programme in a big way. Secondly it would also be inadvisable from the psychological point of view as it would tend to create a barrier between the rural population, for whose benefit the programme is ultimately intended, and the forest department. As it is many people are a bit unhappy with plantations on village common lands because it has imposed restrictions on their freedom to let their animals free in those areas.

Protection to plantations is usually provided by digging protection trenches all round in the case of block plantations and on the outer periphery in the case of strip plantations. Apart from protection trenches, live hedges of babool are also planted along the inner ridges of trenches. After about a year these hedges become almost as impenetrable as barbed wire fences. This method of giving protection to the plantations, though not as foolproof as barbed wire fencing at least in the initial stages, nevertheless has a number of advantages. Firstly it is free of the danger of theft of barbed wire and posts and fences which often times poses a serious problem. Secondly it is much less expensive. Thirdly, the entire cost of providing protection trenches consists of labour costs which means the money is utilised for providing employment to the people of nearby villages. Finally the planting of live hedges means the availability of additional fuelwood and fodder, over and above that contained in the plantation, in years to come. In fact thinnings along live

hedges can start from the third year itself. It may be pointed out that live hedges are being planted on the periphery of mounds also wherever mounds have to be built for planting trees. Similarly on block plantations on undulating land where the trench method is followed sowing of babool on the ridges of the trenches is generally practiced. This helps in augmenting considerably the volume of wood available from the plantations.

In addition to protection trenches malis are also employed for protection of plantations. They perform routine cultural operations like hoeing, weeding, watering etc. and also protect the plantations from grazing animals. The usual practice is to employ one mali for every four kilometres of strip plantation and one or more malis for block plantations depending upon its area. They are paid either the minimum daily wages (Rs.8/- per day in Central and Eastern U.P. and Rs.10/- per day in Western U.P.) if employed on casual basis or Rs.208/- p.m. if employed for longer duration. This also helps in generating employment for the local people as malis usually belong to villages near the plantations.

The use of barbed-wire fencing, however, has not been given up altogether, though it is restricted to the use of existing stocks of barbed wire in a Division and new barbed wire is not being purchased. It is generally used in areas with a high level of risk due to biotic pressures. Plantations are fenced off for the first two or three years to enable

the growth of plants and the barbed wire is then shifted to another place. Wherever this practice is followed the results in terms of survival rate and growth of plants are very good.

For instance the Tala gram samaj plantation near Amethi in Sultanpur was undertaken in an area of 4.50 hectares of undulating land in August 1983. Nine thousand plants mainly of Su-babool, Siris, August, Eucalyptus, Parkinsonia, Mango, Mahua etc. were planted and the plantation was fenced in. When we visited the plantation at the end of November 1983 we found the plants to be very healthy with the average height being 2-3 metres. The survival rate was reported to be 95 per cent. Moreover grasses had grown in abundance in the plantation and the people from the village were to be allowed into the plantation to cut grass. Similarly we also saw another gram samaj plantation in Sultanpur where fencing had achieved remarkable results. This plantation had been raised in the fifties under the Community Development Programme with Shramdan and had been planted with kath sagon, chilbil, shisham etc. However due to lack of protection it had been exposed to browsing and trampling by animals. Though the plants had suffered heavy damage, fortunately the root system had survived. In 1982 the area was enclosed by a barbed wire fence by the Social Forestry Division. In just over a year's time the plantation had regenerated, with healthy plants and an abundance of grasses on the ground.

These observations seem to suggest that where biotic pressures are particularly heavy the use of barbed wire fencing may become necessary for protecting new plantations. This can be easily accomplished by utilising and shifting existing stocks of barbed wire and posts instead of buying them anew as that would involve heavy expenditure. The existing practice of protection trenches and live hedges should be continued for the bulk of the plantations.

Another method of protection which could be tried in some areas, especially on gram samaj plantations, is some variant of the 'Social Fencing' system which has achieved great success in the Sukho Majri Project of the Central Soil and Water Conservation Research and Training Institute. 'Social Fencing' as practiced at Sukho Majri involves firstly tying up restrictions on grazing by cattle and other animals with supply of water and secondly the creation of a peoples (i.e. users) organisation with rights over resources - in this case water and grass - to enforce the restrictions and distribute the resources. In gram samaj plantations restrictions on grazing could be tied up with access to fuelwood to be enforced by a people's organisation. This can only become successful once fuelwood starts becoming available from the plantations.



Another factor which influences the rate of survival of plants is soil conditions. We found the mortality rate to be particularly high in areas of poor soil especially on usar tracts. While the problem affects all the three districts, it is particularly acute in Unnao where there are vast tracts of usar land with high levels of alkalinity or salinity. The only species which can be planted in such soils are *Prosopis Juliflora*, Babool, Kanji etc. and they too cannot survive above a PH level of 10 or 10.50. Anti-usar treatment like the use of gypsum or pyrites tends to be expensive for large plantations. In Unnao dried water hyacinth is being used as anti-usar in plantation pits and mounds. If this is found successful it deserves to be extended on a wider scale as water hyacinth is an endemic weed found in all ponds and tanks in the countryside.

Finally the survival rate of plants also depends to a large extent on climatic factors such as droughts, floods and timely rainfall. The effects of drought and absence of timely rainfall can be mitigated to some extent by manual watering. For this purpose tankers attached to tractors are maintained at each range office. Floods, however, can take a heavy toll of new plants especially as they occur soon after planting operations have been completed. Due to heavy and prolonged floods in most parts of Mathura and Unnao districts in 1983, the mortality of plants in many areas, especially along roadsides, has been very heavy with the result that survival rates at places are as low as 10 per cent. In

fact some areas in these two districts remained waterlogged till as late as December 1983 so that normal beating up operations also could not be taken up.

#### Gram Samaj Plantations

While on the subject of plantations we would like to make a special mention of plantations on gram samaj land as we feel that this is one category of plantation which is likely to have maximum impact on the major objective of the social forestry programme viz. helping village communities meet their needs of fuelwood, fodder and small timber. The success of gram samaj plantations can also play a strong positive role in enlisting the support of the people for the programme and motivating them to extend the plantation work into larger tracts of village common and/or waste lands on their own initiative with technical and managerial help from the Forest Department. It is perhaps with this aim in view that provision has been made in the World Bank Project for planting 'a minimum of 3,000 ha. of pilot community self-help plantings in village common-lands, to demonstrate to the rural population at large the benefits of afforestation', (World Bank, 1979).

The progress of gram samaj plantations in Sultanpur, Unnao, & Mathura has been summarised in Table 9. It will be seen that the maximum coverage both in terms of number of plantations and area planted has been achieved in Sultanpur. In three years 51 gram samaj plantations were raised over an

aggregate area of 477 hectares and over 4 lakh plants of different species were planted. After Sultanpur comes Mathura where 42 gram samaj plantations over an area of 258 hectares were raised in just two years. The number of plants was even higher than in Sultanpur i.e. over 5 lakhs. The progress has been slowest in the case of Unnao. In three years only 14 plantations covering an area of 60.5 hectares were raised. While the actual number of trees planted is not available, it is known from Table 8 that in 1982-83 only 11,400 trees were planted on gram samaj land. Thus we find that the density of plantations is also very low. Incidentally the density of plantations is highest in Mathura (1954 per hectare) with Sultanpur falling in second place (849 per hectare). The density in Mathura is very close to the Departmental norm of 2000 plants per hectare while in Sultanpur it is less than half of this. The norm of 2000 plants/ha, however, cannot be taken as a rigid one because much will depend on the quality of the land and the soil. It is common knowledge that only degraded and waste lands are made available for gram samaj plantations. Many of these areas, especially in Unnao, have high levels of alkalinity or salinity. Under these circumstances the density of plantation is also likely to be affected.

The coverage of gram samaj plantations in all three districts is still very low and the programme would have to be stepped up substantially in the following years if one of the

objectives of the Social Forestry Programme i.e. every village should have its own forest, is to be fulfilled. For instance the number of inhabited villages in each of these districts is as follows : Sultanpur 2491, Unnao 1699 and Mathura 844. So far only 2 per cent of the villages in

Table-9

Details of Gram Samaj Plantations in Sultanpur,  
Unnao and Mathura

District/ Year	No. of Planta- tions	Area(ha.)	No. of plants	Plants/ ha.	Main species
SULTANPUR					
1980-81	5	75.91	37,034	488	{ Eucalyptus, Su-Babool
1981-82	18	179.79	1,53,006	851	{ Babool, Shisham, Siris
1982-83	28	221.10	2,14,804	972	{ Kanji, Arjun, Angust etc.
TOTAL	51	476.80	4,04,844	849	
UNNAO					
1981-	1	6.00	N.A.		{ Babool, Prosopis
1982	5	26.00	N.A.		{ Kanji, Eucalyptus, Siris
1983	8	28.50	N.A.	N.A.	{ Arjun etc.
TOTAL	14	60.50	N.A.	N.A.	
MATHURA					
1982	17	105.20	2,11,500	2010	{ Babool, Prosopis, Kanji
1983	25	153.00	2,92,931	1915	{ Siris, Arjun, Parkinsonia etc.
TOTAL	42	258.20	5,04,431	1954	



Sultanpur, 0.8 per cent in Unnao and about 5 per cent in Mathura have been covered. If we assume that each village should have a 2 hectare plantation then the area to be planted comes to 4982 hectares in Sultanpur, 3398 hectares in Unnao and 1688 hectares in Mathura. As against this the area covered so far is 9.6 per cent in Sultanpur, 1.8 per cent in Unnao and 15.3 per cent in Mathura. This gives us an idea of the magnitude of the task that lies ahead.

E. Extension and Peoples Participation

The success of plantation work on gram samaj land - indeed of the entire Social Forestry Programme - depends to a large extent on a proper and effective extension and education programme to be undertaken by the field staff. In the ultimate analysis the programme would have to become a people's programme in which the initiative for raising plantations on village common lands and other degraded lands would have to come from the people themselves with the Forest Department providing necessary support in terms of technical and managerial help and provision of plants and other inputs. For this to happen two preconditions would seem to be necessary. Firstly there should be constant rapport between the Social Forestry field staff and the rural population so that a feeling of mutual trust is created, secondly certain tangible benefits must flow to all sections of the rural society from the programme in the shape of fuelwood,

fodder and other forest produce within a short period so that they begin to perceive the programme as being for their benefit and not of any one else.

The first task of maintaining constant rapport with the people is admittedly a difficult one especially for a government machinery like the Forest Department which has so far tended to isolate itself from the people by adopting what may be called the 'Reserved Forest' mentality which essentially implies that the people have to be kept out of the forests under the management and control of the Forest Departments. In the process a certain hiatus based upon mutual suspicion seems to have developed in the relations of the Forest Department and its personnel and the people. This is especially the situation in the hill areas of the state which account for the bulk of the forest area in U.P. and where, for this reason, the work of the Forest Department has been concentrated so far. There may have been some justification for the 'Reserved Forest' mentality as long as the aim of forestry and forest management was seen mainly in terms of maximising revenue from the forests and protecting certain areas considered vulnerable. With the advent of Social Forestry, which is predicated on the urgency of meeting the basic needs of the people for fuel, fodder and small timber, there has to be a qualitative change in the approach of the Forest Department to its relations with the people.

This aspect of the programme has been clearly recognised and repeatedly emphasised in the World Bank report on the Social Forestry Project in U.P. (World Bank, 1979). For instance, it clearly states that 'Project success would depend mainly upon the understanding and participation of the rural population at large'. For this it suggests proper publicity and extension work at the village level, training of villagers (both men and women) to demonstrate the benefits of social forestry through field visits, training of the field staff in community development skills and encouraging the involvement of the local population in all aspects of village plantations e.g. selection of area and species to be planted, planting, maintenance and utilisation of plantations by means of the establishment of village forest committees (which would be broad based in membership and also include women) in each participating village. To generate popular support for the tree-plantation programme and to enlist the active participation of the rural population the Project Report also laid stress on taking up 3000 ha. of community self-help plantations on a pilot basis and to encourage the people to plant trees on private lands especially on field bunds, vacant and barren lands and around homesteads.

In operational terms this aspect of the programme involves constant interaction between the field staff of the Social Forestry Divisions and the village community. They

have to motivate the village panchayats either to transfer land to the Forest Department for establishing plantations or to take up plantations themselves on the basis of self-help, convince them of the need for afforestation and the benefits that would accrue to them, and also motivate individuals to take up tree-planting on private lands. All this responsibility they have to bear in addition to their normal workload of maintaining nurseries, raising plantations on public and village common lands, supervising the upkeep of plantations already raised and preparing for future plantations. Thus the field staff is expected to combine extension work with routine plantation and maintenance duties.

Unfortunately, our observations show that the work of extension and community participation have not made much headway in any of the three districts which we visited. The main reason for this is that the field staff (Rangers, Foresters and Forest Guards) have a variety of responsibilities and a large area to cover so that they do not have enough time to establish contact with the people as they are required to do. The area under the charge of a Range Officer covers a Tehsil which may have about 600 villages, while a Forester has responsibility over 4 Development Blocks and a Forest Guard over one Block. Extension work and motivating people's participation in forestry activities calls for special skills and aptitude in addition to constant inter-



action and communication with the village communities. It appears that as yet there is no provision for training in community development skills in the Social Forestry Programme as recommended by the World Bank Project Report. This lacuna needs to be rectified at the earliest. Secondly there also appears to be a need to augment the strength of the staff at the field level. This will help in reducing the area under the charge of each Range Officer, Forester and Forest Guard and they may thereby be able to have greater rapport with the people.

Table 9-A below gives an idea of the staff position in each of the three districts of Sultanpur, Unnao and Mathura. It will be seen that a number of posts lie unfilled in each district. It is interesting to note that the difference between posts sanctioned and posts filled is greatest at the level of Foresters and Forest Guards. Incidentally these are the categories of personnel who have the major responsibility for extension work and maintaining contact with the people. Hence steps should be taken to fill the posts as early as possible. Further it may even be advisable to involve other government agencies/departments engaged in agricultural extension work (e.g. development blocks and agriculture, soil conservation and horticulture departments etc.) to motivate the people to take up agro-and farm-forestry on a big scale. This may be advisable because of the close connection between agriculture and forestry which is not sufficiently

well understood so far. The involvement of these agencies may also be desirable from the point of view of proper land use. As it is some criticism of the social forestry programme at the national level has come to be based on the apprehension that it may lead to large farmers diverting their good productive land from food-grain production to the raising of tree crops (especially eucalyptus) grown mainly for commercial

Table-9A

Staff Strength (Field Staff) Social Forestry Divisions : Sultanpur, Unnao and Mathura

Category of posts	Sultanpur		Unnao		Mathura	
	Sanctioned	Filled	Sanctioned	Filled	Sanctioned	Filled
Range Officers	5	9*	5	3	4	3
Dy. Range Officers	5	5	6	3	5	4
Foresters	23	15	19	17	20	17
Forest Guards	48	24	48	26	45	26
TOTAL	81	53	78	49	74	50

\*The number filled is 4 more than the sanctioned strength. Includes 2 R.Os under training.

purposes. This, it is feared, may lead on the one hand to decline in foodgrain production and on the other to reduction in agricultural employment while ensuring very high return to the large farmers who alone have the capacity to wait 5 to

6 years before their tree crops mature.\* At the same time the planting of tree crops by the large farmers would not increase fuelwood supplies as they would be grown for commercial sale. What this suggests, therefore, is that the plantation, especially on private land should be taken up on the basis of an appropriate land use plan for which the involvement of agriculture and related departments may be necessary.

One of the consequences of the neglect of extension work has been that the scheme for encouraging self-help in raising plantations on common lands has not really taken off. We came across only a few examples of self-help plantations and that too in Sultanpur. The effort of the Department has been concentrated on gram samaj plantations under its own auspices. Table 10 gives some idea of the progress in this respect in the three districts.

It will be seen that the progress of work in raising gram sabha plantations has been satisfactory in Sultanpur and Mathura and not too good in Unnao. In Sultanpur and Mathura the percentage of gram samaj plantations to total area planted has increased from year to year going up from 21 per cent to 28 per cent in Sultanpur and from 17 per cent to 33 per cent in Mathura. In Unnao it is very low - only 5 per cent in 1983 -

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\*Some idea of the returns can be had from the following example. In Mathura we met a large farmer (owning over 100 acres) who had planted 25,000 eucalyptus trees on  $7\frac{1}{2}$  acres of irrigated land. The survival rate was 100%. He had been offered Rs.140 per 6 year old tree by a paper mill at Haryana. Even if he is able to sell 60% of the trees at this price he would be getting Rs.21 lakhs at the end of 6 years without much investment.

and has tended to stagnate at this level during the last two years. The programme therefore needs to be stepped up in Unnao in a substantial way. We feel that in future about one-third to one-half of the new plantations under social forestry should be on gram samaj land.

Table-10  
Progress of Gram Samaj Plantations

(Area in hectares)

District/Year	Area of Gram Samaj Plantation	Total area planted	Gram samaj as % of total
<b>SULTANPUR</b>			
1980-81	75.91	358.47	21.18
1981-82	179.79	682.29	26.35
1982-83	221.10	802.28	27.56
TOTAL	476.80	1843.28	25.87
<b>UNNAO</b>			
1981	6.00	379.00	1.58
1982	26.00	510.50	5.09
1983	28.50	556.50	5.13
TOTAL	60.50	1446.00	4.18
<b>MATHURA</b>			
1982	105.20	604.88	17.39
1983	153.00	458.30	33.38
TOTAL	258.20	1063.18	24.29

Finally we would like to stress the importance of extension and people's involvement from another perspective as well. Social forestry is an entirely new programme in the



country with the result that the general awareness about its importance among the people is rather low, even though it is intended to meet some of their basic needs which are seriously threatened. Thus a vigorous effort is needed to make the people aware of the various dimensions of the problem and secure their willing cooperation for its successful implementation. However, we must also recognise that people's involvement may not be readily forthcoming unless they perceive some tangible benefits accruing to them. Forestry operations, by their very nature, take a few years - five to seven years at a minimum - before yielding usable products. Such a time-frame may not fit in with the people's perceptions of benefits. Hence it is necessary that some benefit should accrue to them even before this period. This is also necessary because in some way or the other they are expected to bear some inconvenience due to the programme of raising plantations especially on village common lands. For instance many of these areas had been used by them in the past for grazing their animals. When plantations are raised, people and animals are denied entry into them causing some degree of inconvenience. Closing off some areas for plantation may also mean lack of direct access to other grazing areas which are still available. There is a likelihood that these measures may hit the poorer sections of the village society hardest. To the extent this happens their enthusiasm for the plantation programme may also be lacking. Further past experience may persuade the poorer

sections of the village society - who, incidentally, face the shortage of fuelwood in the acutest form - to think that the benefits of the plantation programme may not accrue to them but to the already better-off.

Thus to gain the confidence of the rural population in general and of the poorer ones in particular it is necessary that steps be taken to give some immediate benefits. Considerable economic benefits are already flowing to the poorer people in the shape of employment in raising and maintaining plantations. The programme it should be noted is highly employment intensive as most of the costs are labour costs (see below). Employment benefits could be supplemented by raising palatable grasses in existing plantations and allowing the people to cut it free of cost. In fact the World Bank report had also laid stress on this aspect of social forestry when it pointed out : 'Early returns from project activities in the form of abundant nutritive fodder would be a strong incentive for villagers to participate in the programme. Therefore, a silvi-pastoral management system would be adopted whereby grasses and legumes would be planted in the interspaces of plantations'.

Unfortunately we did not find any evidence of silvi-pastoral management in any of the areas visited. At the most what we saw was that villagers were being permitted to cut grasses which had come up on their own as a result of protection. We feel that use of existing plantation areas for

growing palatable grasses and legumes and permitting the villagers to cut them free of cost would help in building up their confidence in, and support for, the programme in a significant way. It would also help to mitigate to some extent their latent hostility to the curtailment of their grazing rights in common lands. If somehow the production of fodder and grasses can be increased then it may go a long way to encouraging the stall-feeding of animals thereby reducing the grazing pressure on plantations. Perhaps it may even be desirable to give priority to fodder over fuel-wood in the initial stages of the programme.

#### 4.3.1 Distribution of Produce

To create and maintain the confidence of the people in the programme it is also necessary that steps be initiated for the equitable distribution of the produce from various types of plantations, and these should be adequately publicised among the people. At present the scheme for distribution has been finalised only in respect of gram samaj plantations. In fact it forms a part of the contract between the gram sabha and Director Social Forestry which is signed for every gram samaj plantation.

The main features of the contract are as under:

- i. The gaon sabha agrees to give possession of the land to the Director Social Forestry for raising a plantation within 30 days of signing the contract.

- ii. The gaon sabha by a resolution agrees to create a Village Forest Committee within 45 days of signing the contract to assist the Director Social Forestry in the implementation of the programme. The Committee would consist of a few official members like Gaon Pradhan (ex-officio Chairman), Gaon Up-Pradhan, Forest Extension Worker, Gram Sewak, Panchayat Secretary and Patwari/Lekhpal and some villagers with special interest in tree planting to be nominated by the Gaon Sabha. The latter category would include at least one woman member, one Scheduled Caste member and two members of the Land Management Committee. The Community Development Forester or Forest Extension Worker would be the ex-officio Convenor and Secretary of the Committee.
- iii. The Committee would assist the Director Social Forestry in the plantation work including selection of species for planting, and arranging for labour - either voluntary or paid.
- iv. The produce would be distributed as follows:
  - a) The members of the Gaon Sabha would have the right to free collection of mahua flowers, grass, leaf fodder, dry wood and branches and broken branches.
  - b) The produce obtained from thinning and felling e.g. fuelwood, posts and small timber for construction will be distributed first to landless, antyodaya and marginal and small farmer families either free or at nominal cost not to exceed 25 per cent of the market price. The balance, if any, would be given to other members of the Gaon Sabha for their personal use as per the price and rules determined by the Gaon Sabha. However,



every family would have an equal right to fuelwood determined on the basis of a specific number of head loads per family.

c) The other produce viz. fruits, flowers, seeds, timber will be sold/auctioned as per existing practice which may include lease of trees also.

v. For the first five years the plantation would be managed by the Director Social Forestry. After that it may be returned to the Gaon Sabha if it so desires. In that case the entire expenditure incurred by the Forest Department in the establishment of the plantation would be returned to it by the Gaon Sabha within 30 years of the establishment of the plantation from the income obtained from it. The refund will be made first from the produce of commercial species and then from the sale of construction timber.

It will be seen that a conscious effort has been made to give preference to the weaker sections of the society (landless, antyodaya families, marginal and small farmers) in the supply of fuelwood. It is too early to say how the system has been working because none of the plantations is in a position to supply any fuelwood as they are less than three years old. We do feel that it may be difficult to enforce preferential treatment to the weaker sections as the scope for leakage is always there and it may be used by the powerful interests to corner most of the produce. In case this happens it may be better to share the produce equally among all the

families either free of cost or partly free and partly at a nominal cost - say in the ratio of 50:50.

While on the subject of sharing of produce of Gram Samaj plantations we would also like to mention that we did not find the active involvement of Village Forest Committees in the raising and management of plantations. Our impression is that these plantations have been raised purely as departmental efforts without much local participation. We feel that the Forest Management Committees should be activated. This will also help them in taking charge of the plantations at the end of 5 years when the Gaon Sabhas could decide to bring them under their control and management.

While some provision does exist for distribution of produce from Gram Samaj plantations, the same cannot be said with regard to other kinds of plantations raised on public lands e.g. roadside, railway line, canal bank and forest block plantations. Though these are entirely under the control of the Forest Department they too have been raised to meet the fuelwood, fodder and small timber needs of the rural population. The produce from these plantations could be given to the local people at a nominal cost which could cover only the costs of cutting trees and transporting them to nearby villages where depots may be established. Alternatively, to save on transportation costs the produce may be sold off at the site of the plantation itself on the basis of headloads.

### G. Employment Generation

The Social Forestry Programme has the potential of making a significant contribution to employment generation in the rural areas, because almost all the operations involved in it - raising plants in nurseries, advanced soil work, plantation and protection and maintenance - are labour intensive. In fact the bulk of the cost of most of the operations consists of labour costs while the material costs are minimal.

In this section therefore we have tried to calculate the employment generated in various kinds of plantation work. Based on this we have tried to work out some norms of employment generation per hectare of plantation and used these norms to estimate the total employment generated in the three districts.

We have presented estimates of employment generation in a few representative plantations of different kinds in Table 11. The assumptions on which these calculations are based are as follows:

- i. The entire expenditure on soil work viz. digging pits, making mounds and digging protection trenches consists of labour costs.
- ii. Sixty per cent of planting and other expenses consist of labour costs, the rest being accounted for by transportation costs, cost of insecticides and weedicides and cost of seeds used for growing live hedges along trenches and mounds.

iii. Employment generation has been calculated on the basis of minimum wages of Rs.8.00 per day being paid at present and Rs.7.00 per day in earlier years.

Table-11

Estimates of Employment Generation in Different Kinds of Plantations

Plantation	Area (ha.)	Expenditure incurred(Rs.)			Emp. gen. (m.d.)	Emp. (m.d.)/ ha.	
		Soil work	Plan- ting	Other			Labour
RAILWAY							
Lucknow- Sultanpur Km.943-952 (1981)	36.00	44163	19852	1602	57035	8147.86	226.33
ROAD-SIDE							
Jamo- Jagdishpur Km.0-4.6 (1983)	2.50	2100	4650	-	4890	611.25	244.50
Lucknow- Kanpur Km.0-4.6 (1983)	21.00	19614	16675	-	29619	3702.38	176.30
CANAL BANK							
Sharda Sahayak Jaunpur Br. Km.66.96- 75.08(1982)	20.00	11618	23020	-	25430	3632.86	181.64
GRAM SAMAJ							
Tala (1983)	4.50	3523	3923	-	5877	734.57	163.24
Saraiya(1983)	3.75	3526	5049	-	6555	819.40	218.51
FOREST BLOCK							
Jansar(1983)	40.00	65390	24200	-	79910	9988.75	249.72
TOTAL	127.75	149934	97369	1602	209316	27637.09	216.34



It will be seen that employment generation in the different kinds of plantations varies from about 163 mandays to about 250 mandays per hectare giving an overall average of 216 mandays per hectare. Assuming, further, that in general about 200 mandays of unemployment is generated per hectare of plantation we find that in 1983 1,60,456 mandays were generated in Sultanpur, 1,11,300 mandays in Unnao and 91,660 in Mathura from the plantations taken up in these districts (see Table 12). This is quite a high level of employment generation by any standard.

Table-12

Estimates of Employment Generated Through  
Plantations : 1983

Districts	Area planted (ha.)	Employment Generated ( man-days)
Sultanpur	802.28	1,60,456
Unnao	556.50	1,11,300
Mathura	458.30	91,660

In addition to employment generation in advance soil work and planting up of the area some employment is also generated in protection of the plantations. This work is usually done by employing malis on a regular basis on a monthly salary of Rs.208.00. Our observations show that generally one mali is employed for each Gram Samaj plantation irrespective of size and on other types of plantations the

average can be taken as one mali per 8 hectares of plantation. Based on these norms the employment generated in protection of plantations for five months of 1983 (August to December) came to 15,097 in Sultanpur, 11,100 in Unnao and 9,774 in Mathura. These calculations are based on the fact that in 1983 the number of gram samaj plantations in Sultanpur, Unnao and Mathura were 28, 8 and 27 respectively covering an area of 221.10 ha., 28.5 ha. and 153.00 ha. respectively. In a full year employment generated in protecting plantations over the same area would come to 21127, 12820 and 15579 man-days respectively in these districts. Thus we find that total employment generated in 1983 (including employment generated in all kinds of activities viz., soil work, planting and protection etc.) works out as follows:

Sultanpur	- 1,70,676 man-days
Unnao	- 1,14,220 man-days
Mathura	- 1,01,515 man-days

Clearly this constitutes a significant contribution of the Social Forestry Programme to the national objectives of employment generation and poverty alleviation. In the process it also helps to create tangible assets which apart from having a long term beneficial impact on the environment would also help in the medium term to meet some of the basic needs of the poorer sections of the rural society. Thus social forestry can also make important direct and indirect contributions to the anti-poverty programme.

#### H. Conclusion

To conclude this evaluation of the Social Forestry Programme in three districts of Uttar Pradesh we would like to point out that in general its implementation has been quite successful, measured in terms of the area planted and the general condition of the plantations. The Officers and other personnel in charge of this programme at the field level are technically very competent and possess a high level of expertise in raising and management of plantations. The programme seems to have been not very successful in the areas of extension and eliciting the participation of the people. By a large it has remained a departmental activity. In order to make it a people oriented and participatory programme, which it was intended to be and should ideally be, it is important that the field staff should be provided training in various aspects of rural development and given necessary skills in community development apart from the regular forestry training. The report of the committee appointed by the Government of India on Orientation of Forest Education in India can provide useful guidelines in this respect. Further the strength of the field staff also needs to be augmented.

We would also like to reiterate that the plantation work and the choice of the areas to be planted should be based on a proper land use plan. For this purpose co-ordination with other agencies of the Government engaged in agricultural development and extension needs to be established. In particular,

care has to be taken that diversion of good irrigated land from agricultural crops to tree cultivation does not take place on a large scale especially on the part of large farmers who alone have the capacity to take to block plantation of trees.

Secondly, we feel that in the Social Forestry Programme major importance should be given to raising plantations on village common lands with the involvement of the people. Of the new plantations to be taken up about one-half should be in this category. Further, wherever such plantations are taken up the Village Forest Committees should be activated and associated with the programme from the very beginning.

Thirdly we feel that the cultivation of palatable grasses and legumes in the interspaces of plantations of all types with the right to villagers to collect them free of cost should be given adequate importance in the programme. This will on the one hand make available much needed fodder to the local population and on the other provide an immediate incentive for them to participate in the programme. In the long run it is also likely to reduce grazing pressure on plantations and may even begin the much needed transformation to stall-freeding of animals.

Finally, in our opinion the Social Forestry Programme should be seen as part of the wider programme of rural development and poverty alleviation because of the significant contribution it is already making to employment generation in the rural areas. The importance of this contribution needs to be appreciated and the programme extended accordingly.



Appendix-IList of Social Forestry Divisions in U.P.

- |    |            |    |               |
|----|------------|----|---------------|
| 1. | Lucknow    | 21 | Bulandshahr   |
| 2. | Sitapur    | 22 | Etawah        |
| 3. | Unnao      | 23 | Mainpuri      |
| 4. | Kanpur     | 24 | Meerut        |
| 5. | Hardoi     | 25 | Bareilly      |
| 6. | Rae Bareli | 26 | Muzaffarnagar |
| 7. | Fatehpur   | 27 | Moradabad     |
| 8. | Sultanpur  | 28 | Badaun        |
| 9. | Pratapgarh | 29 | Bijnor        |
| 10 | Deoria     |    |               |
| 11 | Faizabad   |    |               |
| 12 | Basti      |    |               |
| 13 | Azamgarh   |    |               |
| 14 | Varanasi   |    |               |
| 15 | Jaunpur    |    |               |
| 16 | Ghazipur   |    |               |
| 17 | Allahabad  |    |               |
| 18 | Agra       |    |               |
| 19 | Mathura    |    |               |
| 20 | Aligarh    |    |               |

# Appendix-II

## Forest Plantation Species and Their Properties and Uses

Species	Properties/Uses
1. <u>Acacia nilotica</u> (Babul)	Soil improvement, shade, ornamental, coppicer, small timber/poles, fuel, fodder, tanning, gum, edible fruits.
2. <u>Aegle marmelos</u> (bel)	edible fruits.
3. <u>Albizzia lebbeck</u> (kala siris)	Soil improvement, shade, coppicer, small timber/poles, fuel, fodder.
4. <u>Albizzia procera</u> (safed siris)	soil improvement, shade, ornamental, coppicer, small timber/poles, fuel.
5. <u>Artocarpus integrifolia</u> (Kathal)	Shade, edible fruits.
6. <u>Azadirachta indica</u> (neem)	Shade, ornamental, coppicer, small timber/poles, fuels, fodder, oil seeds.
7. <u>Bauhinia spp.</u> (Kachnar)	Soil improvement, shade, ornamental, fodder.
8. <u>Cassia Siamea</u> (Kassod)	Soil improvement, Shade, ornamental, coppicer, fuel.
9. <u>Dalberghia Sissoo</u> (Shisham)	Soil improvement, shade, ornamental, small timber/poles, fuel, fodder.
10. <u>Delonix regia</u> (Goldmohur)	Shade, ornamental.
11. <u>Embllica Officinalis</u> (aonla)	Edible fruits.
12. <u>Eucalyptus hybrid</u> (eucalyptus)	Shade, coppicer, small timber/poles, fuel.
13. <u>Lucaena leucocephala</u> (Su-babul)	Soil improvement, coppicer, fuel, fodder.

- 14 Madhuca latifolia(mahua) Shade, fodder, edible flowers, oil-seeds.
- 15 Mangifera indica(mango, aam) Shade, ornamental, small timber/ poles, fuel, edible fruits.
- 16 Moringa oleifera(Saijan) Coppicer, fodder, gum, edible fruits, oil seeds, pulp.
- 17 Morus alba (mulberry) Shade, coppicer, industrial timber, fodder, leaves for silk-worms, edible fruits.
- 18 Pongamia pinnata (Kanji) Shade, ornamental, fuel, oil seeds.
- 19 Prosopis juliflora (prosopis, vilayti babool) Soil improvement, coppicer, fuel, fodder.
- 20 Psidium guajava (guava) Edible fruits.
- 21 Syzygium Cumini (jamun) Shade, ornamental, small timber/ poles, fuel, edible fruits, coppicer.
- 22 Tamarindus indica (imli) Shade, ornamental, small timber/ poles, fuel, edible fruits.
- 23 Tamarix articulata (tamarisk) Coppicer, small timber/poles, fuel.
- 24 Terminalia arjuna(arjun) Shade, ornamental, small timber/ poles, leaves for silkworms, tanning.
- 25 Zizyphus jujuba (ber) Edible fruits.

Source : World Bank, Uttar Pradesh Social Forestry Project, Staff Appraisal Report (1979), Annex 2, Table 2.1, p.45.

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